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*Sent via electronic mail*

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Philip Giudice, Commissioner  
Massachusetts Department of Energy Resources  
100 Cambridge Street, 10<sup>th</sup> Floor  
Boston, MA 02114

Rockport, ME  
Portland, ME  
Boston, MA  
Providence, RI  
Hartford, CT  
Charlottetown, PE  
Canada

**Re: Public Comments of ENE (Environment Northeast) concerning  
Massachusetts Biomass Policy**

Dear Commissioner Giudice:

ENE (Environment Northeast) appreciates the opportunity to submit comments on Massachusetts' biomass policy, including biomass eligibility for the Renewable Portfolio Standard (RPS), findings of the Manomet Center for Conservation Sciences' *Biomass Sustainability and Carbon Policy Study*, and the July 7<sup>th</sup> letter from Executive Office of Energy and Environmental Affairs Secretary Ian Bowles to Department of Energy Resources Commissioner Philip Giudice.

ENE is a regional non-profit organization that researches and advocates innovative environmental policies for New England and eastern Canada. ENE is at the forefront of state, provincial, and regional efforts to combat global warming with solutions that promote clean energy, clean air, healthy forests, and a sustainable economy. ENE staff has experience in biomass and forest issues, energy supply and demand, and climate policy.

In the realm of energy policy, biomass has attracted increasing attention as an indigenous energy resource with potential climate and energy independence benefits. Growing interest in biomass power has been accompanied by evolving scientific understanding of the impacts of biomass development on atmospheric greenhouse gas (GHG) concentrations and on forest ecosystems. Through the Green Communities Act and the Global Warming Solutions Act, Massachusetts is a leader in setting important goals for sustainable energy policy and climate mitigation. As Massachusetts seeks to promote beneficial clean energy technologies through its RPS, it is important that policy decisions and accompanying regulations take into account each of the major energy and climate goals that Massachusetts is seeking to achieve, including reductions in greenhouse gas emissions, energy supply diversity, and investments in the cleanest possible energy technologies. Accordingly, all impacts of biomass development should be examined and accounted for, recognizing that public incentives should only be provided to technologies that have measurable environmental benefits.

In particular, this process should be mindful that the purpose of any state's RPS is to encourage market investment in the cleanest, most promising emerging technologies that will allow the state to meet its renewable energy goals. Eligibility for the RPS does not determine whether or not a given technology should exist; rather the RPS is a mechanism to incent advanced technologies with greatest public benefit. As biomass eligibility for the RPS is determined,

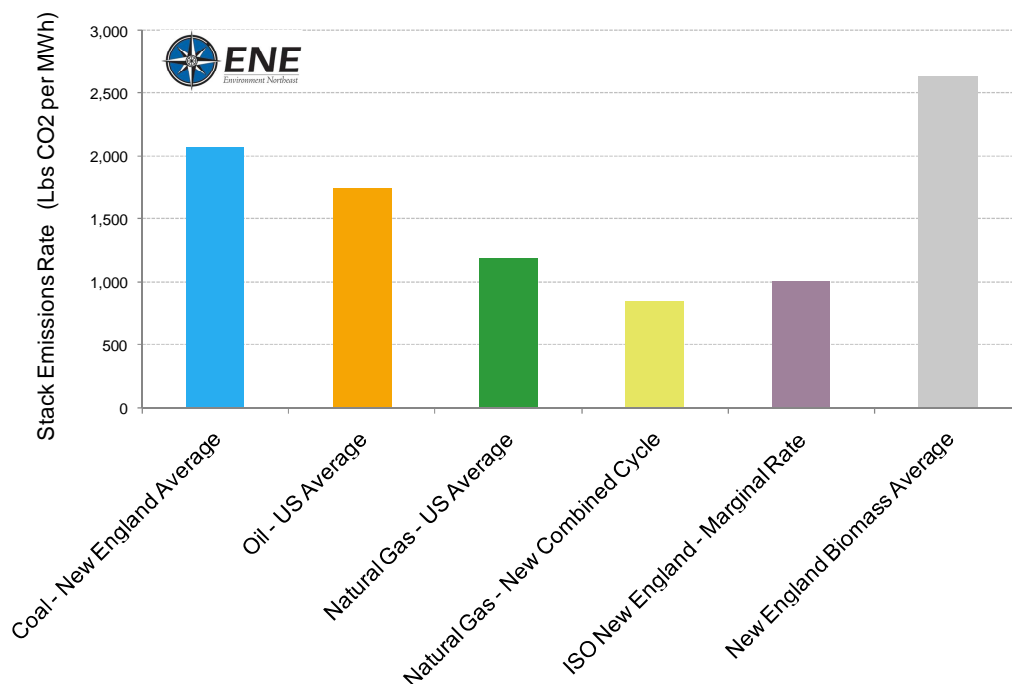
policymakers should ensure that biomass power delivers net GHG benefits based on accurate accounting; maximum practicable efficiency (the resource is limited); strong air quality and ecosystem protections; and consistent treatment of eligible biomass facilities in the state and region.

## I. Ensuring Climate Benefits through Accurate Greenhouse Gas Accounting

In assessing qualification criteria for RPS eligibility, DOER must consider the overall climate impacts of biomass energy and should only qualify those applications and projects that bring demonstrable climate benefits.<sup>1</sup> Using the best available science, DOER should require all facilities seeking RPS qualification to meet stringent greenhouse gas limits on a full lifecycle basis.

Accurate lifecycle GHG accounting is of paramount importance to biomass development because stack emissions from biomass-fueled generating plants are higher than emissions from coal fired power plants.<sup>2</sup> (See Figure 1.) CO<sub>2</sub> emissions can be recaptured through regrowth of forests over time, but to ensure a net reduction in emissions, biomass power developers must demonstrate, and the Department must verify that forest-sourced wood is harvested sustainably and that lifecycle impacts are accurately accounted for.

**Figure 1: Comparative smokestack CO<sub>2</sub> emissions for various generation sources**  
(Does not account for sequestration)



Sources: Meier et al 2005, ISO New England 2007 Marginal Emissions Analysis,

<sup>1</sup> In addition to the RPS provisions of the Green Communities Act (Mass. Gen. Laws c. 25A section 11F), the Department should design biomass eligibility criteria that are consistent with the Commonwealth's overall climate policies including the economy-wide GHG limits set out in the Global Warming Solutions Act (Mass. Gen. Laws c. 21N).

<sup>2</sup> The average stack CO<sub>2</sub> emissions rate for biomass electric generation units in the northeast is 2630 lbs/MWh compared to 2071 lbs/MWh for existing coal boilers (Meier et al., 2005, ISO-NE 2007 Marginal Emissions Analysis).

Among the lessons of the Manomet-led study is that all biomass feedstocks do not have the same GHG profile.<sup>3</sup> Accordingly, the Department, in setting RPS qualification standards, must treat different feedstocks differently. Biomass from timber harvests can only deliver lifecycle carbon benefits and/or other environmental benefits if sustainable harvesting is demonstrated using verifiable and enforceable criteria. Forest sources must be managed to ensure that there is a verifiable carbon balance between forest growth and lifecycle biomass emissions, including wood harvesting and emissions associated with the transportation of biomass fuel. Using clean wood waste from manufacturing operations and wood cut for utility tree trimming, development, and purposes other than whole tree timber harvesting as feedstock can improve the overall lifecycle GHG emissions profile of the biomass energy. Accordingly, disclosure by biomass plants of (i) the mix of feedstocks and their characteristics going into the facility and (ii) the harvesting done by landowners who provide virgin wood is critical to accounting for the CO<sub>2</sub> balance at any given biomass plant. Reasonable sourcing standards should lead to increases in due diligence of fuel supply during development and prevent over-build of biomass.<sup>4</sup>

As the Department develops its draft revisions to the RPS regulations, it should require disclosure by biomass developers of critical details of feedstock sourcing, including characteristics such as: (a) the geographic source and property or manufacturing description; (b) species; (c) stand age; (d) volume harvested (e) forest certification or management information, as well as any other information deemed necessary to determine sustainability of the feedstock. A chain of custody requirement and a reasonable level of third party verification of the feedstock sources and characteristics should also be required.

Secretary Bowles, in his July 7<sup>th</sup> letter, sets out a potential qualifying threshold requiring that:

“...[biomass] generating sources must, over a twenty (20) year life cycle, yield at least a fifty percent (50%) reduction in greenhouse gas emissions per unit of useful energy relative to the lifecycle greenhouse gas emission from 1) the operation of a new combined cycle natural gas electric generating facility using the most efficient commercially available technology as of the date of application for the portion of electricity delivered by the biomass system and, if applicable, 2) the operation of the fossil fuel fired thermal energy unit being displaced, or in the case of new thermal load, a gas fired thermal energy unit using the most efficient commercially available technology as of the date of application, for the portion of thermal energy delivered by the biomass system.”<sup>5</sup>

From ENE’s perspective, this is a reasonable starting point, although the Department may wish to consider even more stringent requirements to ensure that the lifecycle GHG emissions of RPS-eligible biomass operations approach zero. Unlike other RPS-eligible technologies, (e.g., wind and solar), biomass is not automatically a carbon free fuel, so care must be taken to delineate those fuel sources that do not qualify for RECs and those that do.

The Department should establish an emissions limit and emissions factors by feedstock type to calculate net emissions. In so doing, biomass from sustainably harvested and certified land (e.g., FSC certified) might be assigned one emissions factor and waste material from a saw mill another, with the mix of feedstocks and appropriate emissions factors used to determine an average emissions rate in a given period (e.g., month or quarter).

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<sup>3</sup> Walker et al., *Biomass Sustainability and Carbon Policy Study*, Section 6.1, p. 95

<sup>4</sup> Ibid, Section 2.6.1, p. 24

<sup>5</sup> EOEAA Secretary Bowles letter to DOER Commissioner Giudice, p. 3

## II. Maximizing Plant Efficiency

In order to promote biomass technologies that deliver maximum public benefit, RPS regulations should establish minimum efficiency thresholds for both electric-only and combined heat and power (CHP) biomass applications, and additional RPS credit should be awarded to CHP facilities for utilization of thermal energy. Maximizing efficiency is a worthwhile goal for all power conversion technologies, and achieving the most useable energy per unit of feedstock is especially important when utilizing limited biomass resources. Climate benefits of biomass power derive from the sequestration of atmospheric carbon by biomass feedstocks, and efficient use of biomass fuel produces greater quantities of energy per ton of carbon emissions, thus improving the carbon profile of biomass and delivering greater climate benefit.

Efficiency thresholds and incentives for CHP are required to overcome market barriers that inhibit commercialization of the most efficient technologies. As noted in the Manomet study,<sup>6</sup> generation of electricity alone from biomass is most efficient in the 20-50MW range, at which scale utilization of thermal energy adversely affects plant economics. Conversely, small thermal-led CHP units can become less economical when electric generation is included. RPS incentives that provide credit for thermal load could improve the economics of CHP units and thereby promote technologies that reach 75%-85% efficiency.<sup>7</sup> Fortunately, a template for crediting thermal energy exists within the CHP incentives of the Alternative Energy Portfolio Standard (AEPS), which could be used to inform biomass RPS incentives.

In order to achieve the emissions reduction goals of the Global Warming Solutions Act, Massachusetts should adopt a balanced approach that does not preclude potentially beneficial technologies. In the interest of providing financial incentives for the commercialization of diverse biomass technologies, ENE does not believe that efficiency thresholds should limit RPS credit to CHP units only, but rather that ambitious yet achievable thresholds should be set to push biomass electric generation toward advanced technologies, including gasification of fuel and combustion in a combined cycle turbine.<sup>8</sup> Promoting balanced yet ambitious technologies though the Massachusetts' RPS enhances the precedential value of the Commonwealth's groundbreaking efforts, creating a well-rounded policy suite to inform other state, regional or federal policies. Additionally, efficiency thresholds within the RPS should be periodically examined and revised to reflect technological improvements and promote the most advanced biomass applications.

Finally, establishing appropriate plant locations and sizes is another important component of making the most efficient use of our biomass resources in order to avoid placing unsustainable demands on limited biomass resources and in order to reduce the emissions associated with transporting feedstocks to the plant.

## III. Air Quality Protections

In addition to greenhouse gases, biomass generation plants can emit high amounts of non-CO<sub>2</sub> pollutants such as nitrous oxides (NO<sub>x</sub>) and particulate matter (PM). In order to prevent adverse health impacts, emission of non-CO<sub>2</sub> pollutants should be avoided or minimized

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<sup>6</sup> Walker et al, Section 2.4, p. 22

<sup>7</sup> Ibid.

<sup>8</sup> While integrated gasification combined cycle (IGCC) technology is not yet widely applied to biomass combustion, pilot projects (such as the plant in [Värnamo, Sweden](#)) and academic literature suggest that IGCC provides the greatest opportunity to increase the efficiency of biomass electric generation from the present average of 20-25% (Walker et al, p.20) to 43% (Gustavsson & Madlener, 2003) or higher (Pihl et al, 2010).

through source restrictions and air pollution control technology. To ensure that increases in biomass generation spurred by the Massachusetts RPS do not lead to increased local air pollution, the Department should require that RPS-eligible facilities, at a minimum, comply with existing air quality standards that apply to fossil fueled power plants and industrial sources. Moreover, these biomass plants must be subject to biomass-specific Best Available Control Technologies (BACT) that apply to NO<sub>x</sub>, PM, toxics, and other pollutants. To determine the appropriate BACT standards and enforcement mechanisms, the Department should rely on the expertise and recommendations from the Department of Environmental Protection.

#### IV. Ecosystem Protections

Supplying fuel for expanded biomass generation will increase demands on the forests of Massachusetts and neighboring states, and RPS regulations should safeguard against adverse impacts on forest ecosystems through the application of harvesting guidelines specifically designed for biomass fuel harvests. Supplying biomass for power production could drive both an increase in demand for wood extracted from the forest, and alter the type of wood that is extracted from the forest. Unlike current forest harvesting practices that remove logs and leave behind smaller woody material important to ecosystem health, biomass harvests for power could lead to the extraction of whole trees and centralized processing of residues, adversely affecting water and soil quality, biodiversity, habitat, and overall forest health.<sup>9</sup>

In order to avoid these adverse impacts, forest ecosystems should be protected through management practices that protect the forests ecosystem health and longevity. Current regulations and guidelines for forest harvesting in Massachusetts were not designed for the intensification of biomass harvesting that will likely result from biomass power development,<sup>10</sup> and should be supplemented with guidelines more suitable to protect overall forest health, such as the *Forest Guild Biomass Retention and Harvesting Guidelines*.<sup>11</sup>

#### V. Equitable Treatment of All RPS-Eligible Biomass Facilities

In revising its RPS regulations, the Department should strive for consistent treatment of all qualifying facilities. This equitable treatment should include not only facilities inside and outside Massachusetts, but also existing facilities and facilities designed and built after the revised regulations take effect. The overall goal of the RPS is to stimulate the development of new, advanced renewable technologies that are unable to compete in the wholesale electric marketplace without recognition of their environmental benefits. The RPS should provide economic incentives to desirable energy sources in order to help them get over the hump to full commercial scale, and should phase out once technologies or applications have achieved commercial parity with conventional generating sources.

In this context, the Department should set clear standards that address how existing RPS-eligible facilities will be treated under revised RPS regulations, with the ultimate goal of requiring existing plants to comply fully with the new rules. In making this recommendation, ENE is mindful of the large investments required to build a biomass facility and the need for market certainty in making such investment decisions. As a result, ENE proposes that the Department allow existing plants to operate and receive renewable energy credits under earlier RPS regulations for a limited period of time (*e.g.*, 5 years from the date the facility was qualified as RPS-eligible),

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<sup>9</sup> Walker et al., *Biomass Sustainability and Carbon Policy Study*, Section 4.2.2.2, p. 64

<sup>10</sup> Ibid, Section 4.3.3, p. 70.

<sup>11</sup> Walker et al., recommend *Forest Guild Biomass Retention and Harvesting Guidelines* as an appropriate source for guidelines. ENE agrees that these guidelines merit consideration by the Department.

provided that there is no back-sliding on current compliance and operating performance. Upon the conclusion of the limited transition period, that existing facility must comply with the current RPS regulations or it would no longer qualify for the RPS.

ENE believes that this proposal would strike an appropriate balance between the need to incentivize new technologies and the market certainty required to allow existing and continued financing of facilities.

### Conclusion

ENE appreciates the opportunity to provide these comments and commends the Governor, Secretary and the Commonwealth's environmental and energy agencies for their thoughtful dedication to supporting strong, balanced biomass policy that encourages the responsible development of our indigenous forest resource, protects against adverse impacts on air quality and ecosystem health, and delivers maximum climate benefit. We look forward to participating alongside other stakeholders as the Department develops its revised regulations.

Respectfully submitted,

*/s/ Jeremy McDiarmid*

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Ellen Hawes, Forest Policy Analyst  
Peter Shattuck, Carbon Markets Policy Analyst

### References:

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